Yetter FARM EQUIPMENT
Leading Edge

Take Time to Scout—and Reap Benefits

Each spring, after the all-important planting has occurred, take the time to scout. Be on the lookout—information you gather on pests, weeds, disease, planting depth and evenness of emergence, and signs of nutrient deficiency can help you address problems in your fields and equipment, to achieve higher yields this season and in subsequent seasons.

Step one: be prepared

Before heading out into the field, make sure to pack the necessary tools. A notebook or scouting forms from a local agronomist are absolutely essential—the only useful information is detailed and accurate information. If you want to consult an expert on something you observe, plastic bags to gather samples or a digital camera to take a good picture will come in handy. And make sure you have the tools to properly examine the crop yourself: a spade or trowel to dig up plants and examine roots, a tape measure, a magnifying glass, and a knife to slit open plants to check for disease or injury.

A scout's toolbox

- Notebook
- Magnifying glass or hand lens
- Tape measure
- Plastic bags, vials, and labels
- Spade or trowel
- Field scouting guides
- Knife
- Camera

It's also important to do some prep work before you start scouting. Part of this preparation is developing a field history, which can help you distinguish between simple abnormalities and actual problems. The most useful field history will be a written record that can be carried into the field, and it will include field locations and specific names for field identification (this can include GPS information); crops planted in the field the previous one to three years; variety or hybrid; planting date, row width, and tillage operation methods used; pesticide names, rates, and application dates; common weather patterns; fertilizer application rate and method of application; soil test results; soil type; and previous pest problems.[i]

To catch potential problems before they get out of hand, scouting should take place soon after planting.

Out in the field, it's important to sample multiple areas to get useful data. Walk across the field in V- or W-pattern and collect random samples (eight to ten should do it). Concentrate efforts in areas where the pest, disease, or weed problem is most likely to occur. Regular weekly scouting is recommended for the first half of the season.[ii] Diseases and insects may seem to appear suddenly, but problems often start in small numbers. Identifying the problem early may mean spot treatment will be successful, which is why frequent scouting is so critical. Breathe a sigh of relief,

though—not all the tasks described in this article have to be performed at the same time.

Catching problems—before they are problems

One of the primary functions of crop scouting is to catch insects, weeds, and diseases before they get out of control. The following are some basic guidelines for pest and disease crop scouting, but growers should learn the specific threats that their region and soil types are most vulnerable to. It is also important to know your limits. An analysis by a professional crop scout may quickly reap a return on investment.

Key 1: Know the economic injury level (break-even point based on economic factors) for treatment and also the economic threshold (infestation level at which control becomes beneficial). Be able to apply these to individual situations.

Key 2: Know the history of your fields and consider the impact of details such as herbicides applied the previous year.

Key 3: Know the characteristics of a healthy crop, then look for signs of crop damage such as thinning, stunting, early dying, discoloration, or damaged stems or leaves. Each disease and insect will cause specific damage to a crop, so it is also important to be familiar with the symptoms of a wide variety of infestations and diseases. Understand the pests and their life cycles.

Key 4: Analyze the weather, crop stage, weed development, and pest biology so scouting occurs at the right time.

Key 5: When scouting for pests, be aware that different sampling methods are appropriate for different pests.

Key 6: Record keeping is perhaps the most important step in crop scouting. Records should include: the field location; how the samples were collected; record of data collected at each site; plant counts; row spacing; stage of crop development; and crop damage, if it is present. Use clear language so you can benefit from the report year after year.

Look to the future

Like pests and weeds, poor performance of the planter and its attachments could have a negative impact. Research indicates that corn yields can increase as much as 15 bushels per acre simply by improving planter performance.

It's easier to evaluate plant spacing while plants are still young, so make sure to get into the fields early. Calculating the standard deviation is the best way to check consistency of spacing.

Check spacing on young plants—plant spacing can have a big effect on yield potential.

According to agronomy experts, for every one-inch increase in the standard deviation above a threshold of two inches, the yield-loss potential for corn is about two bushels an acre.

Measure the distance between 30 consecutive plants. Repeat this process four times at randomly selected points. The standard deviation is a common statistical measure that most spreadsheet programs can calculate.

While measuring standard deviation, also check for missing plants, irregular spacing, and two-plant hills. Each problem indicates planter malfunction and can lead to a loss of yield.

Experts speculate that doubles or triples could weaken a crop's ability to handle stress, and these close neighbors compete for water and nutrients. Skips affect yield slightly more than doubles, and these have the most detrimental effect in fields where population is at or slightly below the optimum.

Double-dropped, irregularly-spaced, and skipped seeds are often the result of the planter being operated at a speed that is higher than recommended in the owner's manual. Typically, the speed for planting should be limited to four to five miles per hour.

Worn seed meter components, poorly lubricated chains and fittings, and mismatch of seed size to planter plate or disc size can also cause the uneven plant density that negatively affects yields.

Variation in emergence equals trouble for yields

Even more important than plant spacing to achieve high yields is uniform emergence. A growth stage difference of two leaves or more between adjacent plants will almost always result in the smaller (younger) of the plants being barren or producing nubbins. Ideally, emergence of all plants will occur in a 24-hour period.

Equipment-related emergence issues can be resolved through the right combination of coulter blades, residue managers, adequately adjusted seed placement equipment, and an effective closing wheel system. Producers should take special care when making down pressure adjustments, as this step is often mishandled.

Coulter blade selection has an enormous impact on emergence and root development. The proper coulter blade will ensure ideal seed-to-soil contact and fracture soil crusts directly around the seedling for excellent closure. Through coulter tillage techniques, the capacity of the soil to hold moisture is improved, aiding germination and uniform emergence.

Check rows for excessive and large residue in seed trenches. When properly used, residue managers eliminate planter bounce and hairpinning, two factors that can contribute to problems with seed placement and seed-to-soil contact.

Seeds planted too deep or shallow due to poor planter adjustment will also contribute to emergence problems. If scouting reveals seeds that have swelled but not sprouted, they may have been planted too shallow. Nodal roots developing above ground also point to shallow planting. These roots are

exposed to more environmental conditions and have a higher probability of encountering disease and nutrient deficiency.

Seeds that emerge and are leafing out underground could be the result of too deep a placement. No emergence could also be the result if seeds are planted too deep. As a rule of thumb, corn should be planted about two inches deep. This depth will need to be adjusted depending on soil moisture.

If scouting reveals evidence of poor seed-trench closing, poorly adjusted or selected closing wheels could be to blame. If the seed trench is not closed properly, all previous efforts to improve yield are jeopardized. There is a wide variety of closing products currently available on the market to prevent such misfortune. Spiked-closing wheels and drag chains are two popular choices.

Watch for nutrient deficiency

Scouting can help catch nutrient deficiencies early, allowing time for side dressing if needed.

Attention should be paid to the height and color of young plants as scouting is conducted. Yellowing leaf tissue, or chlorosis, and stunted growth indicate a lack of nutrient availability. Many nutrients are needed for chlorophyll production, so it's hard to pinpoint exactly which nutrients are in short supply. Generally, chlorosis of corn rows at V3 stage or older leaves may be caused by a shortage of mobile nutrients such as nitrogen, potassium, and magnesium. In younger leaves, it may indicate a deficiency of an immobile nutrient such as sulfur or iron. Stunting may be the only indication of a lack of phosphorous. If you notice deficiencies during scouting, your plants may have already compromised yield potential. Side dressing additional nutrients may be an option to boost yields before harvest, but consider the addition of a starter fertilizer when planting next year to ensure your crops never go hungry.

Scout now, reap benefits later

The key to high yields is an effective combination of weed, insect, and disease management as well as tillage and equipment management—and scouting provides the critical information that leads to effective management. Relatively inexpensive adjustments to equipment and processes, or a change to the nutrient management plan, can yield huge benefits. Awareness and commitment to improvement will result in higher yields from future crops.

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[i] Fred Fishel et al., *Integrated Pest Management: Introduction to Crop Scouting,* College of Agriculture, Food and Natural Resources, University of Missouri Extension, <http://ipm.missouri.edu/ipm_pubs/ipm1006.pdf>, accessed on March 23, 2012.

[ii] Clarke McGrath, "Keep Ahead of Nature's Curveballs," June 2011, <http://farmprogress.com/california-farmer/library.aspx/keep/ahead/of/natures/curveballs/41/51/1161>, accessed on March 23, 2012.